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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

**On Appeal to the Board of
Appeals and Interferences**

Appellant(s) : Akio Yamada et al. Examiner : Truc T. Nguyen
Serial No. : 10/726,204 Group Art Unit: 2833
Filed : December 2, 2003
Title : CONNECTOR

A P P E A L B R I E F

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APPEAL BRIEF

Commissioner for Patents
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

On August 8, 2005, Appellants filed a Notice of Appeal from the final rejection of twice-rejected claims 1-11 and 15 contained in the Office Action dated April 7, 2005. The Notice of Appeal was received by the U.S. Patent and Trademark Office on August 10, 2005.

Applicants hereby submit, pursuant to 37 C.F.R. § 41.37, an Appeal Brief in support of the appeal of the rejections of pending claims 1-11 and 15 and a check to cover the fee for a four-month extension.

I. REAL PARTY IN INTEREST

The real party in interest is DDK Ltd., 2-11-20, Nishi-gotanda, Shinagawa-Ku, Tokyo, Japan. ("DDK"). DDK is the assignee of the entire right, title, and interest in the present application by way of Assignment with execution date of November 18, 2003, recorded on December 2, 2003 at Reel 014764 and Frame 0151.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claims 1-11 and 15 stand finally rejected and are the subject of this appeal.

Claims 12 and 16 stand objected to, the examiner indicating that these claims would be allowable if rewritten in independent form including the limitation of the claims from which they depend.

Claims 13-14 stand canceled.

IV. STATUS OF AMENDMENTS

Appellants have not submitted after-final amendments.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 recites, “1. A connector comprising a housing and a required number of pusher members (connector 10; housing 12; pusher members 14; figs. 1, 2A, 2B, and 4-6 and page 7, l. 11 - page 8, l. 2 and page 9, ll. 19-31), said housing including a fitting aperture into which at least three flexible printed circuit boards are inserted (fitting aperture 18; flexible printed circuit boards 16; fig. 6; page 7, ll. 24-29 and page 8, ll. 18-21 and page 9, ll. 9-12), said housing further including an insertion opening for holding said required number of pusher members (insertion opening 22; figs. 1, 2A, 2B, and 4-6 and page 7, l. 24 - page 8, l. 2) so that when said flexible printed circuit boards are inserted into said fitting aperture of said housing (Figs. 2B and 6 and page 8, ll. 18-21), contact portions (contact portions 36; figs. 1, 2B, 3A, 3B, 4-7) of said at least three flexible printed circuit boards (Figs. 4 and 6 and page 9, ll. 9-12) are urged by said pusher members so as to be connected to each other to achieve electrical continuity of the connector (Fig. 6 and page 8, l. 18 - page 9, l. 12), wherein said pusher members have substantially a U-shape (Figs. 2A, 2B, and 6 and page 9, ll. 4-7) and are formed of a unitary part (Figs. 2A, 2B, and 6 and page 9, ll. 19-31) and said pusher members each comprise pushing portions extending towards the flexible printed circuit boards (pushing portions 20; figs. 1, 2A, 2B, and 4-6 and page 9, ll. 4-12).

Independent claim 2 recites, “2. A connector comprising a housing and a required number of pusher members (connector 10; housing 12; pusher members 14; figs. 1, 2A, 2B, and 4-6 and page 7, l. 11 - page 8, l. 2 and page 9, ll. 19-31), said housing including a fitting aperture into which two flexible printed circuit boards are inserted (fitting aperture 18; flexible printed circuit boards 16; fig. 2B; page 7, ll. 24-29 and page 9, ll. 9-12), said housing further including

insertion openings for holding said required number of pusher members (insertion opening 22; figs. 1, 2A, 2B, and 4-6 and page 7, l. 24 - page 8, l. 2) so that when said flexible printed circuit boards are inserted into said fitting aperture of said housing (Figs. 2B and 6 and page 8, ll. 18-21), contact portions (contact portions 36; figs. 1, 2B, 3A, 3B, 4-7) of said two flexible printed circuit boards (Fig. 2B and page 7, ll. 24-29 and page 9, ll. 9-12) are urged by said pusher members so as to be connected to each other to achieve electrical continuity of the connector (Fig. 2B and page 8, l. 18 - page 9, l. 12), wherein said pusher members have substantially a U-shape (Figs. 2A, 2B, and 6 and page 9, ll. 4-7) and are formed of a unitary part (Figs. 2A, 2B, and 6 and page 9, ll. 19-31) and said pusher members each comprise pushing portions extending towards the flexible printed circuit boards (pushing portions 20; figs. 1, 2A, 2B, and 4-6 and page 9, ll. 4-12).

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection for review are:

(1) the rejection of claims 1-5 and 15 under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Pat. No. 5,350,310 to Roberts ("Roberts")¹ in view of U.S. Pat. No. 5,928,029 to Lam ("Lam"); and

(2) the rejection of claims 6-11 under § 103(a) as allegedly obvious over Roberts in view of Lam and further in view of U.S. Pat. No. 5,163,847 to Regnier ("Regnier").

¹ Based upon the reference numerals used by the examiner in the April 7, 2005 Final Office Action and October 6, 2004 Non-Final Office Action, Appellants will assume that the examiner's citation to (1) "Roberto (US 4,975,068) and "Roberto" throughout the April 7, 2005 Final Office Action and July 13, 2005 Advisory Action Before the Filing of an Appeal Brief; and (2) "Roberto (US 5,350,319) and "Roberto" throughout the October 6, 2004 Non-Final Office Action reflect the examiner's reliance on U.S. Pat. No. 5,350,319 to Roberts and not U.S. Pat. No. 4,975,068 to Squires.

VII. ARGUMENT

A. Introduction

The examiner has improperly rejected claims 1-5 and 15 under 35 U.S.C. § 103(a) as being obvious from Roberts and Lam and claims 6-11 under § 103(a) as being obvious from Roberts, Lam, and Regnier. The examiner's Rejections are incorrect and should be reversed.

The claimed invention is directed to a connector having a housing containing a fitting aperture into which two or at least three flexible printed circuit boards are inserted. *See* Abstract. When the two or at least three flexible printed circuit boards are inserted into the fitting aperture of the housing, the contact portions of the two or at least three flexible printed circuit boards are urged by pusher members so as to be connected to each other to achieve electrical continuity of the connector. *See* Abstract.

In contrast, Roberts is directed to a connector system "for reliably and releasably connecting the conductive circuit paths of a flexible circuit to closely packed (high density) conductive pads of a PC board...." *See* Roberts, Col. 1, ll. 56-60.

B. Rejections of claims 1-5 and 15 under 35 U.S.C. § 103 based upon combined teachings of Roberts and Lam

i. *Argument for Independent Claim 2*

The examiner alleges that "Roberto discloses a connector comprising: a housing (1); two flexible circuits (12) having contact areas (13); pusher members (7); fitting aperture (18); insertion openings (36); and a position means (4, 5)" and concluded that "Robert[s] substantially

disclose[s] the claimed invention except the pushing member being a U-shaped member.” April 7, 2005, Office Action at page 2.

Although the examiner alleges that Roberts discloses all limitations of claim 2 “except the pushing member being a U-shaped member,” Roberts does not disclose or suggest the limitation of “a fitting aperture into which *two flexible printed circuit boards are inserted*” required by claim 2. (emphasis added). To the contrary, the “two flexible circuits (12)” are “mounted” to pins 11 and 22 of the outer module 2 or 3 of the connector 1 “[d]uring assembly” of the connector. *See* Roberts, Col. 4, ll. 59-67; FIGS. 2, 3; *see also* Roberts, Col. 4, ll. 12-23. Because the “two flexible circuits (12)” are fixed during assembly of the connector, they cannot be “inserted” into fitting aperture 18. Thus, for at least this reason, Roberts neither discloses nor suggests the limitation of “a fitting aperture into which two flexible printed circuit boards are inserted” as required by claim 2.

Furthermore, because the “flexible circuits (12)” are not “flexible circuit boards” that are inserted into the aperture of the housing, Roberts, additionally, does not disclose or suggest the limitation of “when said flexible printed circuit boards are inserted into said fitting aperture of said housing, contact portions of said two flexible printed circuit boards are urged by said pusher members so as to be connected to each other” as required by claim 2.

Even assuming *arguendo* that the “flexible circuits (12)” are “flexible circuit boards” that are inserted into the aperture of the housing as required by claim 2, Roberts does not disclose or suggest that these flexible circuits are “urged by said pusher members *so as to be connected to each other to achieve electrical continuity of the connector*” as additionally required by claim 2. (emphasis added). Rather, the flexible circuits 12 are mounted to the connector such that “these

components adopt the position shown in FIG. 2 with conductive contacts 13 of the flexible circuits 12 facing one another within the unitary structure so that they extend into passage 35 and *are exposed in the opening 18 of the connector.*” (emphasis added). Roberts, Col. 4, ll. 63-67. Thus, the flexible circuits 12 cannot possibly be “connected to each other to achieve electrical continuity of the connector” as required by claim 2 at conductive contacts 13. This accords with Roberts’ objective, which is to connect the contact pads 19 of an “edge connector portion of a circuit board (see FIG. 11)” to the contact areas 13 of the flexible circuits and not to connect the flexible circuits 12 to one another at conductive contacts 13. *See* Roberts, Col. 4, ll. 24-28; Figs. 11 and 5; *see also* Col. 1, ll. 56-63.

Although Roberts discloses “a connector for connecting electrical conductor areas of a flexible circuit with conductor pads of an edge connector portion of a circuit board,” Roberts, Col. 2, ll. 8-11, the examiner does not cite this “circuit board” as anticipating or rendering obvious claim 2 (or any of the other claims, for that matter) in any way in any of the office actions. Nevertheless, even if the examiner somehow intended to cite to this “circuit board” for the purpose of anticipating or rendering obvious claim 2, Roberts does not disclose or suggest the limitation of “when said flexible printed *circuit boards* are inserted into said fitting aperture of said housing, contact portions of said two flexible printed *circuit boards* are urged by said pusher members *so as to be connected to each other*” as required by claim 2. (emphasis added). Rather, Roberts discloses that “[t]he connector 1 defines an opening 18 having a chamfered entrance leading to a passage 36 for receiving and accurately registering an edge connector portion of a circuit board [35] for connection of contact pads 19 thereof to the contact areas 13 [of the two flexible circuits 12].” Roberts, Col. 4, ll. 24-28; FIGS. 11 and 5. Accordingly,

Roberts discloses connection between the contact areas 13 of two flexible circuits 12 and the contact pads 19 of a *single circuit board* 35 when the *single circuit board* 35 is inserted into “fitting aperture” 18. *See* Roberts, FIGS. 1, 2, and 11. Thus, Roberts neither discloses nor suggests the limitation of claim 2 of “when said flexible printed *circuit boards* are inserted into said fitting aperture of said housing, contact portions of said two-flexible printed *circuit boards* are urged by said pusher members *so as to be connected to each other.*” (emphasis added).

ii. Argument for Independent Claim 1

The examiner has alleged that “[r]egarding claim 1, 3 and 5, similarly to the rejection of claims 2, 4, 15, Roberto substantially disclosed the claimed invention except for there is a three flexible circuit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the flexible circuits up to three flexible circuits, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.” April 7, 2005, Office Action at page 3. Appellants disagree.

Claim 1 recites all of the limitations of claim 2 except that claim 1 requires “at least three flexible printed circuit boards” be inserted into a “fitting aperture” whereas claim 2 requires insertion of only “two flexible printed circuit boards.” Thus, Appellants reassert the patentability arguments presented above in connection with claim 2 and submit that claim 1 is patentable for the same reasons as claim 2. Accordingly, claim 1 cannot be rendered obvious by recourse to the examiner’s argument that “mere duplication of the essential working parts of a device involves only routine skill in the art.” April 7, 2005, Office Action at page 3.

iii. Argument for Dependent Claims 3-5 and 15

Appellants submit that, because claims 4 and 15 depend, either directly or indirectly, from independent claim 2, and thereby contain all of its limitations, claims 4 and 15 cannot be rendered obvious by the combination of Roberts and Lam. Appellants further respectfully submit that, because claim 1 is not rendered obvious by Roberts and Lam, claim 3, which contains all of the limitations of claim 1, cannot be rendered obvious by reliance on these references. Finally, Appellants submit that, because claim 5 multiply depends from either claim 3 or 4, which depend from claims 1 and 2, respectively, and so contain all of their limitations, claim 5 cannot be rendered obvious by the Roberts and Lam combination.²

C. Rejections of claims 6-11 under 35 U.S.C. § based upon combined teachings of Roberts, Lam, and Regnier

i. Argument for Dependent Claims 6-11

The examiner rejected claims 6-11 as “unpatentable over Roberto (US 4,975,068), Lam (US 5,928,029), and in further view of Regnier (US 5,163,84 7).” April 7, 2005, Office Action at page 3. Appellants disagree.

Claims 6-11 depend directly from claim 5 and thereby contain all of its limitations. As set forth above, claim 5 is not rendered obvious by Roberts and Lam. Furthermore, Regnier has been cited only for disclosing “a circuit (10) having slit (16),” April 7, 2005, Office Action at page 3, and has not been cited against claim 5 for the limitations not taught by Roberts and Lam. Therefore, Appellants respectfully submit that claims 6-11 that depend from claim 5 cannot be

² It should be noted that the examiner only rejected those parts of multiply dependent claim 5 that depend from claim 3, April 7, 2005, Office Action at page 3, and did not reject those parts of multiply dependent claim 5 that depend from claim 4.

rendered obvious by the examiner's reliance on Regnier's disclosure for "a circuit (1) having a slit (16)."

Accordingly, the obviousness rejection of claims 6-11 should be reversed.

VIII. CLAIMS APPENDIX

The following claims are the subject of this appeal:

Claim 1 (rejected): A connector comprising a housing and a required number of pusher members, said housing including a fitting aperture into which at least three flexible printed circuit boards are inserted, said housing further including an insertion opening for holding said required number of pusher members so that when said flexible printed circuit boards are inserted into said fitting aperture of said housing, contact portions of said at least three flexible printed circuit boards are urged by said pusher members so as to be connected to each other to achieve electrical continuity of the connector, wherein said pusher members have substantially a U-shape and are formed of a unitary part and said pusher members each comprise pushing portions extending towards the flexible printed circuit boards.

Claim 2 (rejected): A connector comprising a housing and a required number of pusher members, said housing including a fitting aperture into which two flexible printed circuit boards are inserted, said housing further including insertion openings for holding said required number of pusher members so that when said flexible printed circuit boards are inserted into said fitting aperture of said housing, contact portions of said two flexible printed circuit boards are urged by said pusher members so as to be connected to each other to achieve electrical continuity of the connector, wherein said pusher members have substantially a U-shape and are formed of a unitary part and said pusher members each comprise pushing portions extending towards the flexible printed circuit boards.

Claim 3 (rejected): The connector as set forth in claim 1 wherein said contact portions of said at least three flexible printed circuit boards are arranged in opposition to each other such that said contact portions can be connected on being urged against each other by said pusher members.

Claim 4 (rejected): The connector as set forth in claim 2 wherein said contact portions of said two flexible printed circuit boards are arranged in opposition to each other such that said contact portions can be connected on being urged against each other by said pusher members.

Claim 5 (rejected): The connector as set forth in claim 3 or 4 further comprising positioning means for said flexible printed circuit boards.

Claim 6 (rejected): The connector as set forth in claim 5 wherein said at least three flexible printed circuit boards are each formed with slits between the adjacent contact portions.

Claim 7 (rejected): The connector as set forth in claim 5 wherein either, or both, of said flexible printed circuit boards are each formed with slits between the contact portions.

Claim 8 (rejected): The connector as set forth in claim 5 wherein said at least three flexible printed circuit boards are formed with slits between each pair of two adjacent contact portions.

Claim 9 (rejected): The connector as set forth in claim 5 wherein either, or both, of said flexible printed circuit boards are formed with slits between pairs of each two adjacent contact portions.

Claim 10 (rejected): The connector as set forth in claim 5 wherein said at least three flexible printed circuit boards are each formed with slits between the adjacent contact portions arbitrarily selected to provide a compliance to said adjacent contact portions.

Claim 11 (rejected): The connector as set forth in claim 5 wherein either, or both, of said flexible printed circuit boards are each formed with slits between the adjacent contact portions arbitrarily selected to provide a compliance to said adjacent contact portions.

Claim 12 (objected to): The connector as set forth in claim 6 wherein said positioning means comprises flanges at longitudinal ends of said housing, each of said flanges being provided with a pin, and said flexible printed circuit boards are formed with apertures for receiving said pins such that when said pins are received in said apertures of said flexible printed circuit boards, said contact portions of said flexible printed circuit boards positionally coincide with each other.

Claims 13-14 (canceled)

Claim 15 (rejected): The connector as set forth in claim 4 further comprising positioning means for said flexible printed circuit boards.

Claim 16 (objected to): The connector as set forth in claim 11 wherein said positioning means comprises flanges at longitudinal ends of said housing, each of said flanges being provided with a pin, and said flexible printed circuit boards are formed with apertures for receiving said pins such that when said pins are received in said apertures of said flexible printed circuit boards, said contact portions of said flexible printed circuit boards positionally coincide with each other.

IX. EVIDENCE APPENDIX

None.

X,


RELATED PROCEEDINGS APPENDIX

None.

For the foregoing reasons, the examiner's rejection of claims 1-11 and 15
should be reversed.

Respectfully submitted,

Dated: Feb 9, 2006

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